

Remarks

Claims 61-64, 66-72 and 77 are being examined on their merits. Applicants have previously cancelled without prejudice Claims 1-60. With this paper, Claims 68 and 78-89 have been canceled without prejudice. New Claims 90-99 have been added and are believed to be definite by particularly pointing out and distinctly claiming subject matter regarded as an invention. New claims 90-99 introduce no new matter.

On page 3 of the Office Action mailed June 10, 2008, Claims 61 and 67-72 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,280,530 (hereinafter "Trew") in view of U.S. Patent No. 6,483,538 (hereinafter "Hu"). Applicants respectfully request entry of amended Claim 61, amended to further disclose elements of the claim, including that the feature of Claim 61 is translated relative to the pixels. Support for the amended language may be found throughout the as-filed specification, such as at paragraphs [0052]-[0053]. Applicants respectfully submit that independent Claim 61 (as amended) and Claim 71 are not obvious over Trew alone or in view of Hu. Applicants point out that the Trew reference is directed to template matching, a method initially disclosed by Applicants' in their specification at, for example, paragraphs [0045]-[0049] and method improved upon by Applicants' in their application as-filed. Applicants' specifically pointed out in their specification several drawbacks associated with template matching, a method that relies solely on a correlation function for estimating a position, such drawbacks including errors between the actual and estimated (X, Y) position (para. [0049]). Trew, itself, points out that its own correlation method "cannot represent all of the changes accurately, and repeated interpolation rapidly reduced the spatial resolution of the template." While Trew considers tracking and predicting changes of a position via use of a Kalman filter, there are known faults with use of such a model, as recognized by one of ordinary skill in the relevant art and as pointed out by Trew at, for example, Col. 9, ll. 15-27. Furthermore, Applicants point out that the Trew reference does not obtain coordinates of a feature within a fraction of a pixel. The Examiner has, in the Office Action mailed June 10, 2008, agreed with this by stating that Trew "does not teach a method of correlation wherein coordinates are determined with subpixel precision." Moreover, Applicants point out that Trew does not move a feature

relative to the pixel, such as by the fraction portion of the (X, Y) value of the estimated coordinates. In addition, Trew does not re-evaluate the correlation function at the best matched position (and its surrounding neighbors) to generate a more accurate set of coordinates, that will only differ from the actual translated coordinates by an error factor that is very small. Thus, on a thorough reading of Trew, it is clear that the reference is not able to correct for aliasing. Trew relies on the user to “see whether the tracking is satisfactory” (Col. 12, ll. 10-34). As such, Trew lacks several essential elements of Applicants’ claimed invention and alone cannot be used for a showing of obviousness. In fact, it is pointed out that the only overlapping subject matter between Trew and Applicants’ claimed invention is the basic concept of tracking an object over one or more image frames.

The Examiner combines Trew with Hu to suggest that the combination may teach or suggest Applicants’ claimed invention. Applicants’ respectfully disagree with this position. Hu describes a system for aligning a test image with a reference image. Unfortunately, Hu suffers from the same drawback as Trew by not being able to correct for aliasing and not offering a solution to the problem of aliasing. For example, with Hu, a feature in the test image is aligned with a feature in the reference image by overlaying a test block on each image. However, the feature in the first test block may be in a different place, relative to the first test block, than the feature in the second test block, relative to the second test block. Hu applies a fast Fourier transform (FFT) within each test block in each image and then cross-correlates the FFTs to determine a shift in position between images. Yet, applying an FFT to one test block will not result in the same outcome as the FFT performed on the other test block when the feature were not originally and completely aligned. The position of the feature in the test image, relative to the pixels of the test image, will not change by shifting the test block. Instead, different areas of pixels will be used for each FFT. If aliasing has occurred to the feature in the test image, shifting the test block will not have any effect on the aliasing that is present with the test image. Thus, the cross-correlation method of Hu is merely a curve fitting model; the method of Hu does not translate the feature relative to the pixel. Thus, even if Trew were combined with Hu, the combination clearly does not teach each and every element of Applicants’ claimed invention or the invention on its whole. As such, the combination is not successful and cannot be used for a showing of obviousness.

On page 8 of the Office Action mailed June 10, 2008, Claims 62-64, 66 and 77 were rejected under 35 U.S.C. 103(a) as being unpatentable over Trew in view of Hu and further in view of U.S. Patent No. 6,208,769 (hereinafter "Pankratov"). As described above, the combination and Trew and Hu are unsuccessful and teaching or suggesting Applicants' claimed invention. Pankratov does not correct for the lack of teachings in Trew and/or Hu. Pankratov merely discloses a method of locating sub-pixel maximum on a two-dimensional grid. Pankratov searches all grid points on a two-dimensional grid to identify point M which has the maximum grid point value then grid point values neighboring M are searched and those having the next greatest grid point value are selected after which four one-dimensional maxima along lines of a quadrangle that encompass M and its next greatest point values are computed, which is followed by a corrected estimate being calculated by adding a correction factor, which is then applied to the calculated subpixel location.. Clearly, Pankratov does not teach the method of Claims 61 or 77. As such, Trew in view of Hu and further of Pankratov when combined may not be relied on for a showing of obviousness against the claimed invention.

Applicants respectfully request the rejections presented in the Office Action mailed June 10, 2008, be removed and the subject Application for patent be allowed to proceed to issue.

Conclusion


In light of the amendments and remarks presented with this paper, Applicants respectfully submit that the pending and amended claims beginning on page 2 of this paper are in condition for allowance. Accordingly, favorable consideration for and allowance of such claims are respectfully requested.

A Petition for Extension of Time and the appropriate fee for a two-month extension is provided with this paper. It is believed that no additional fees are due. If this is incorrect, the Commissioner is authorized to charge those fees, other than the issue fee, that may be required by this paper to Deposit Account No. 07-0153.

Should the Examiner have any questions or comments, or if further clarification is required, it is requested that the Examiner contact the undersigned at the telephone number listed below.

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Respectfully submitted,
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